

in the art would not be reasonably apprised of the scope of the invention given that term. As a result, the Examiner found the claim to be indefinite. Applicants contend that the Examiner is wrong on both counts. Concerning the phrase “generally insulative material,” one of ordinary skill in the art would define an insulator to be

[a] material that, *ideally*, conducts no electricity; it can therefore be used for isolation and protection of energized circuits and components Actually, *no insulator is perfectly nonconductive*

. . . .

(Gibilisco, THE ILLUSTRATED DICTIONARY OF ELECTRONICS (6th ed. 1994)(defining the term “insulator”)(emphasis added). A copy of the relevant page of the DICTIONARY is included in Appendix 2 of this Amendment and Response.) Thus, one of ordinary skill in the art would understand that the term “generally” as used in the phrase “generally insulative material” acknowledges the lack of an ideal and perfect insulator. Moreover, the Specification provides non-limiting yet supporting examples of a “generally insulative material” in the form of a dielectric layer incorporating an oxide charge and a contaminant; wherein the dielectric layer may be BPSG, BSG, PSG, or silicon dioxide; the oxide charge may be positive or negative; and the contaminant may be carbon. As a result, the Specification provides further guidance to one of ordinary skill in the art as to what a “generally insulative material” may be.

Similarly, concerning the phrase “generally conductive element,” one of ordinary skill in the art would define a conductor to be a “material which conducts electricity with *ease*.” (DICTIONARY (defining the term “conductor”)(emphasis added). A copy of the relevant page of the DICTIONARY is included in Appendix 2 of this Amendment and Response.) Based on this definition, one of ordinary skill in the art accepts that a conductor is a material that *easily* conducts electricity. Applicants contend that claim 60’s use of the term “generally” is no less definite than the term “easily,” which is considered to be sufficiently definite in the art. Further, such an artisan would understand that “[v]arious materials *vary widely* in their suitability as conductors.” (*Id.*) Therefore, such an artisan understands that the term “generally” as used in the phrase “generally conductive element” also acknowledges the wide variance of conductivity exhibited by various materials.

As for claim 60’s generally conductive element being “generally laterally coextensive” with an intervening insulating region, Applicants contend that non-limiting support for that term

may be found in FIGS. 1 and 3 of the Application and the Specification's text describing those figures, wherein a lead 26 is above an insulating region 14 yet, as the cross-sections illustrate, need not extend laterally to the same mathematically exact degree as does the insulating region 14. Guided by such disclosure, Applicants assert that one of ordinary skill in the art would understand the term "generally" as used in the phrase "generally laterally coextensive"

As a second basis for rejecting claim 60 under §112, the Examiner argued that its term "intervening insulating region" lacked antecedent basis. The proper antecedent basis may be found in claim 60's preamble, which refers to "an" intervening insulating region.

II. Rejection of claim under §102

The Examiner rejected claim 52 as being anticipated by Doan (U.S. Patent 5,372,974). Applicants have amended claim 52 to clarify its distinction from the matters disclosed in Doan. Specifically, claim 52 requires depositing a dielectric layer over a semiconductor substrate, the substrate *comprising a plurality of electrically conductive regions and an electrically insulative region therebetween*. Applicants contend that Doan fails to disclose such a limitation and therefore fails to anticipate claim 52.

III. Rejection of claims under §103

The Examiner rejected various groups of claims based on various combinations of references. Applicants address each basis for rejection separately below.

A. Rejection of claims based on Doan and Cunningham

The Examiner rejected claims 53-57 as obvious in light of Doan in combination with Cunningham (U.S. Patent 5,468,689). However, an obviousness rejection requires that the multiple prior art references suggest to one of ordinary skill in the art to combine the references. (*See United States Surgical Corp. v. Ethicon Inc.*, 103 F.3d 1554, 1564, 41 U.S.P.Q.2d 1225, 1233 (Fed. Cir. 1997), *cert. denied*, 522 U.S. 950 (1997).) Further, when the prior art contains conflicting references, the ability of each reference to suggest solutions to one of ordinary skill in

the art must be considered. (*See In re Young*, 927 F.2d 588, 18 U.S.P.Q. 1089 (Fed. Cir. 1991).) (Copies of these cases are included in Appendix 3 to this Amendment and Response.) Applicants contend that while the Examiner attempted to present a motivation for combining Doan and Cunningham, those references conflict with each other so greatly that any motivation to combine is untenable. In fact, the references motivate one of ordinary skill in the art to avoid their combination.

Cunningham, for instance, touts concern over material cracking during reflow. (Cunningham at col. 1, ln. 45-53.) As a result, Cunningham teaches providing a nitride barrier 14 over its “top” layer 13. (*Id.*; *see also* col. 3, ln. 21-38; FIG. 1.) Significantly, however, Cunningham does not provide its nitride barrier between layers that comprise its stack. (*Id.*) Thus, one of ordinary skill in the art is lead to believe that there is no need for such a barrier in those location and hence, no cracking issues there.

On the other hand, Doan, which also expresses concern over material cracking during reflow, indicates that cracking between layers of the stack is a major problem. Specifically, Doan teaches providing a nitride barrier between each and every layer of its stack. (Doan at col. 4, ln 28- col. 5, ln. 9; FIGS. 6-7.) Thus, in light of Cunningham, Doan appears to one of ordinary skill in the art to require unnecessary redundancy in terms of barrier layers, thereby adding unnecessary time, money, and effort to the fabrication process. Conversely, in light of Doan, Cunningham appears to the artisan to leave its device susceptible to the very cracking problem Cunningham seeks to avoid. Given such fundamental conflicts, Applicants assert that the references lack the ability to suggest solutions to one of ordinary skill in the art and in fact discourage their combination. Thus, without a legally proper motivation to combine, the obviousness argument against claims 53-57 fails. Accordingly, the only amendment to claim 53 has been to put it in independent form by expressing the limitations originally presented in claim 52.

B. Rejection of claims based on Doan, Cunningham, and Ying

The Examiner rejected claims 58 and 59 as obvious in light of Doan and Cunningham in combination with Ying (U.S. Patent 5,384,288). In fact, the Examiner’s reasoning is essentially the same as that used to reject these claims in the last office action, based on the combination of

Doan and Ying alone. (Office Action dated 1/26/01 at p. 3-4.) In response to the prior rejection, Applicants pointed out the inconsistencies between Doan and Ying that would discourage combination. (Amendment and Response submitted 7/26/01.) Applicants contend that their earlier argument, which need not be repeated here, applies equally to the current rejection and that adding Cunningham to the combination does not cure the fundamental conflicts between Doan and Ying.

In fact, adding Cunningham exacerbates the conflicts between the references in the attempted combination. As discussed in part (A) above, Doan and Cunningham also conflict on a fundamental level, indicating a further lack of their ability to suggest solutions to one of ordinary skill in the art and further discouraging the proposed Doan/Cunningham/Ying combination. In addition, Cunningham and Ying also conflict. Significantly, the processes taught in both references require a barrier material such as a nitride. Cunningham requires that its nitride barrier 14 expose a portion of a silicon substrate 11 in order to grow GaAs thereon. (Cunningham at col. 3, ln. 21-38; FIG. 1.) Ying, on the other hand, requires that its nitride barrier 14 expose none of the substrate 10 in order protect the substrate 10 from subsequent process. (Ying at col. 3, ln. 18-28; FIGS. 1A-1C.) Thus, one of ordinary skill in the art attempting to combine the references would achieve a Cunningham-type device with a continuous nitride barrier that covers the substrate and hinders the desirable growth of GaAs. Alternatively, the artisan would achieve a Ying-type device having a nitride barrier that exposes the substrate, thereby allowing undesirable deterioration during subsequent processing. Either combination is unworkable and hence provides further discouragement in attempting a Doan/Cunningham/Ying combination.

C. Rejection of claims based on Doan and Ghezzi

The Examiner rejected claims 60-61 and 63-64 as being obvious in light of Doan in combination with Ghezzi (U.S. Patent 5,132,239). In fact, the Examiner's reasoning is the same as that used to reject these claims in the last office action. (Office Action dated 1/26/01 at p. 4-5.) Applicants responded to the rejection, pointing out the inconsistencies between Doan and Ghezzi that would discourage combination. (Amendment and Response submitted 7/26/01.) Applicants contend that their earlier argument, which need not be repeated here, applies equally to the

current rejection. In the latest Office Action, the Examiner failed to consider the conflicts between the references highlighted by Applicants, as required by the rule in *Young* (18 U.S.P.Q. 1089). Moreover, the Examiner admitted that hindsight was used to determine obviousness, and claimed that other case precedent justified that action.

Specifically, the Examiner cited *In re McLaughlin* (443 F.2d 1392, 170 U.S.P.Q. 209 (C.C.P.A. 1971)) for support. However, *McLaughlin* actually favors Applicants in that it highlights the Examiner's failure to meet the *prima facie* burden for this and all of the other obviousness rejections. *McLaughlin* emphasizes that, in considering whether to combine references for an obviousness rejection, the Examiner must consider what the references "*taken as a whole* would suggest to one of ordinary skill in the art." (*McLaughlin*, 170 U.S.P.Q. at 212 (emphasis added).) Applicants assert that considering the references as a whole necessitates more than merely focusing on their points that may arguably support an obviousness rejection; rather, it further requires considering the conflicts between the references, as required by *Young*. The Examiner failed to address such conflicts, either in the first Office Action (dated 1/26/01) or, after being reminded by Applicants, in the last Office Action. Hence, the Examiner has failed to satisfy the standards set forth by the very case precedent cited by the Examiner.

Moreover, the Examiner's failure to address the conflicts between the references suggests that the Examiner has ignored those conflicts and somehow been able to focus on certain aspects of the references that justify, in the Examiner's mind, the rejection of the relevant claims. Applicants submit that the guidance for such focus can only come from the current application. In using the current application in such a manner, the Examiner has violated another tenet of *McLaughlin*, which requires that the "[j]udgment on obviousness . . . not include knowledge gleaned only from applicant's disclosure." (*McLaughlin*, 170 U.S.P.Q. at 212.) Thus, the conflicts within the Doan/Ghezzi combination and the Examiner's failure to address those conflicts warrant a withdrawal of any rejection relying on that combination.

D. Rejection of claim based on Doan, Ghezzi, and Van Der Scheer

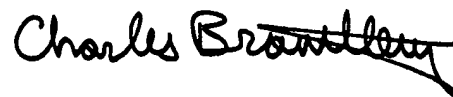
The Examiner rejected claim 62 as being obvious in light of Doan and Ghezzi in combination with Van Der Scheer (U.S. Patent 4,976,856). As with the rejection addressed in part (C) above, the Examiner raised essentially the same rejection and offered the same

supporting argument in the last office action as in the first Office Action. (See Office Action dated 1/26/01 at p. 6.) As a further parallel with part (C), Applicants responded to the rejection, pointing out the inconsistencies between the references. Specifically, Applicants noted that each reference in the proposed combination conflicts with the other two references in the combination. Applicants contend that the response still supports the patentability of the claim yet will not repeat the arguments here to avoid redundancy. This is especially appropriate as – just as in part (C) above – the Examiner has still failed to consider those conflicts in attempting to address the motive to combine. Accordingly, the consequences and result are the same here as in part (C): the Examiner's failure to address the conflicts between the references suggests that the Examiner has failed to consider the references as a whole, ignored those conflicts, and been able to focus on certain aspects of the references based on knowledge gleaned from the current application; thus, the Examiner's conduct fails to satisfy the standards set forth in *McLaughlin* and *Young*, which warrants a withdrawal of this rejection.

CONCLUSION

In light of the above remarks, Applicants submit that claims 52-64 are allowable over the applied references. Therefore, Applicants respectfully request reconsideration of the Examiner's rejections and further requests allowance of all of the pending claims. If there are any matters which may be resolved or clarified through a telephone interview, the Examiner is requested to contact Applicants' undersigned attorney at the number indicated.

Respectfully submitted,



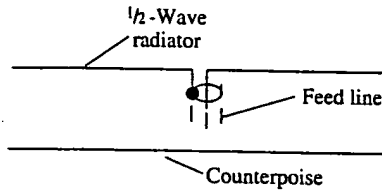
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Appendix 1: Marked-up version of amended claims

52. (Once amended) A method of processing a semiconductor device, comprising:
- depositing a dielectric layer over a semiconductor substrate, said substrate comprising a plurality of electrically conductive regions and an electrically insulative region therebetween;
 - allowing electrically chargeable particles to occur in said dielectric layer;
 - allowing some diffusion of said electrically chargeable particles; and
 - preventing at least some of said electrically chargeable particles from reaching said substrate.
53. (Once amended) [The method in claim 52, wherein:] A method of processing a semiconductor device, comprising:
- depositing a dielectric layer over a semiconductor substrate, wherein said step of depositing a dielectric layer comprises depositing a dielectric layer using an organic precursor;
 - allowing electrically chargeable particles to occur in said dielectric layer, wherein said step of allowing electrically chargeable particles to occur in said dielectric layer comprises allowing an organic component of said organic precursor to deposit in said dielectric layer;
 - allowing some diffusion of said electrically chargeable particles; and
 - preventing at least some of said electrically chargeable particles from reaching said substrate, wherein said preventing step comprises layering a barrier over said substrate using a non-organic precursor prior to said step of depositing a dielectric layer.

Appendix 2

Gibilisco, THE ILLUSTRATED DICTIONARY OF ELECTRONICS (6th ed. 1994)(defining the terms
“conductor” and “insulator”)



condenser antenna

making the output current alternate accordingly. Also called *capacitor microphone*.

condensing routine A computer program that takes an object (user written) program from an internal or external memory to punched cards in a way that maximizes the cards' storage capacity.

condensite A plastic insulating material whose base is phenol formaldehyde resin.

conditional Dependent on some external factor, and therefore subject to change.

conditional branch The point in a computer program where a relational test is performed and the statement line in which the test is made is left so that an out-of-sequence instruction can be implemented. Such a branch might be made, for example, following the BASIC statement "If Z = Y then go to (another line in the program)."

conditional branch instruction The instruction in a computer program that causes a conditional branch.

conditional implication operation A Boolean operation in which the result of operand values *a* and *b* are such that the output is high only if input *a* is high and input *B* is low. Also called *inclusion, if-then operation*.

conditional jump See CONDITIONAL BRANCH.

conditional stop instruction In a computer program, an instruction that can cause a halt in the run, as dictated by some specified condition.

conditional transfer See CONDITIONAL BRANCH INSTRUCTIONS.

condition code A set of constraints for a computer program. The condition code sets the limits on what can be done with the computer under certain circumstances.

conditioning 1. The process of making equipment compatible for use with other equipment. Generally involves some design or installation changes. 2. Interfacing.

Condor A continuous-wave navigational system giving a cathode-ray-tube display for automatically determining the bearing and distance from a ground station. Compare BENITO.

conductance Symbol, *G*. Unit, siemens. The ability of a circuit, conductor, or device to conduct electricity. Conductance is the reciprocal of resistance $G = 1/R = I/E$.

conducted heat Heat transferred by conduction through a material substance, as opposed to convection (movement of matter) and radiation (which

occurs through empty space). A heat sink conducts dissipated energy away from a transistor, for example.

conducting layer See KENNELLY-HEAVISIDE LAYER.

conduction 1. The propagation of energy through a medium, depending on the medium for its travel. 2. The transfer of electrons through a wire. 3. The transfer of holes through a P-type semiconductor material. 4. Heat transfer through a material object (see CONDUCTED HEAT).

conduction angle See ANGLE OF CONDUCTION.

conduction band In the arrangement of energy levels within an atom, the band in which a free electron can exist; it is above the valence band in which electrons are bound to the atom. In a metallic atom, conduction and valence bands overlap; but in semiconductors and insulators, they are separated by an energy gap.

conduction current 1. The electromagnetic-field flow that occurs in the direction of propagation. A measure of the ease with which the field is propagated. 2. Current in a wire or other conductor.

conduction-current modulation In a microwave tube, cyclic variations in the conduction current; also, the method of producing such modulation.

conduction electron See FREE ELECTRON.

conduction error In a temperature-acutated transducer, error caused by conduction of heat between the sensor and the mounting.

conduction field An energy field that exists in the vicinity of an electric current.

conductive coating A conducting layer applied to the glass envelope of a cathode-ray tube, such as an oscilloscope tube or picture tube. Also see AQUADAG.

conductive coupling See DIRECT COUPLING.

conductive material See CONDUCTOR.

conductive pattern The pattern of conductive lines and areas in a printed circuit.

conductivity Symbol, Σ . Unit, S/m (siemens per meter). Specific conductance, i.e., conductance per unit length. Conductivity is the reciprocal of resistivity: $\Sigma = 1/\rho$.

conductivity meter A device for measuring electrical conductivity. Generally, such a device is calibrated in mhos.

conductivity modulation In a demiconductor, the variation in conductivity resulting from variation of charge-carrier density.

conductivity-modulation transistor A transistor in which the bulk resistivity of the semiconductor material is modulated by minority carriers.

conductor 1. A material which conducts electricity with ease, such as metals, electrolytes, and ionized gases. Various materials vary widely in their suitability as conductors; the conductivity of commercial copper, for example, is almost twice that of aluminum. Compare INSULATOR. 2. An individual conducting wire in a cable, insulated or uninsulated.

conduit A hollow tube, made of plastic or metal,

insulated-gate field-effect transistor Abbreviation, IGFET. See METAL-OXIDE SILICON FET.

insulated resistor A resistor around which is molded a nonconducting material, such as vitreous enamel or a plastic.

insulating tape Electrical insulation in the form of a thin, usually adhesive, strip of fabric, paper, or plastic.

insulation 1. A coating of dielectric material that precludes a short circuit between a conductor and the surrounding environment. 2. The application of a dielectric coating to an electrical conductor. 3. Electrical separation between or among different components, circuits, or systems.

insulation breakdown Current leakage through, and rupture of, an insulating material because of high voltage stress.

insulation ratings Collectively, the dielectric constant, dielectric strength, power factor, and resistivity of an insulating material. Sometimes included are such physical properties as rupture strength, melting point, and so on.

insulation resistance The very high resistance exhibited by a good insulating material. It is expressed in megohms (or higher units of resistance) for a sample of material of stated volume or area.

insulation system Collectively, the materials needed to insulate a given electronic device.

insulator 1. A material that, ideally, conducts no electricity; it can therefore be used for isolation and protection of energized circuits and components (also see DIELECTRIC). Actually, no insulator is perfectly nonconductive (see, for example, INSULATION RESISTANCE). 2. Any body made from an insulating material.

insulator arcover A sudden arc, or flow of current, over the surface of an insulator, because of excessive voltage.

integer A whole number, as opposed to a fraction or mixed number.

integral 1. Symbol, \int . 1. The sum of an infinite series of values (increments) making up a quantity. Thus, $\int dx = x$. Compare DIFFERENTIAL. Also see DEFINITE INTEGRAL, INDEFINITE INTEGRAL, INTEGRAL CALCULUS, and INTEGRATION. 2. The part of a number to the left of the radix point.

integral action In automatic control practice, a control action delivering a corrective signal proportional to the time the controlled quantity has differed from a desired value.

integral calculus The branch of mathematics concerned with the theory and applications of integration. Also see DEFINITE INTEGRAL; INDEFINITE INTEGRAL; INTEGRAL; INTEGRATION. Like differential calculus, integral calculus is a powerful tool in electronics design.

integral contact In a relay or switch, a contact that carries current to be switched.

integral-horsepower motor A motor rated at 1 horsepower.

integral multiple A whole multiple of a number. Thus, a harmonic is an integral multiple of a fundamental frequency f : $2f$, $5f$, $10f$, and so on.

integral number See INTEGER.

integrand A function or equation which is to be integrated. Thus, in the integral expression $\int y dx$, the integrand is $y dx$. Also see INTEGRAL; INTEGRAL CALCULUS; INTEGRATION.

integrate 1. To perform the function of mathematical or electrical integration. 2. To construct a circuit on a piece of semiconductor material.

integrated Constructed on a single piece of material, such as a semiconductor wafer.

integrated amplifier An AF amplifier having a preamplifier, intermediate amplifier, and output amplifier on a single chassis.

integrated capacitor In an integrated circuit, a fixed capacitor in which one "plate" is a layer of material diffused into the substrate; the dielectric, a thin oxide film grown on top of the first layer; and the other plate, a metal layer deposited on top of the oxide film.

integrated circuit Abbreviation, IC. A circuit whose components and connecting "wires" are made by processing distinct areas of a chip of semiconductor material, such as silicon. Integrated circuits are classified according to construction, a few being monolithic, thin-film, and hybrid.

integrated data processing Abbreviation, IDP. The detailed electronic classification, sorting, storage, and mathematical processing of data within a coordinated system of equipment, usually at one location.

integrated electronics That branch of electronics that is concerned with the design and fabrication of integrated circuits.

integrated resistor See DIFFUSED-LAYER RESISTOR.

integrating circuit See INTEGRATING NETWORK.

integrating galvanometer A device for measuring the change in electric flux produced in a coil in an electric field. Even very slow changes can be measured.

integrating meter An instrument whose indication is a summation (usually) of an electrical quantity that is time-dependent, e.g., ampere-hour meter, watt-hour meter.

integrating motor An electric motor that follows the integral of the input signal, the angle of rotation of the motor shaft is equal to the integral of an input waveform.

integrating network A four-terminal RC network (series resistor, shunt capacitor) whose output voltage is (or is proportional to) the time integral of the input voltage. Compare DIFFERENTIATING NETWORK.

integrating photometer An indicating photometer whose reading is the average candlepower at all angles in one plane.

integration Finding a function when its derivative is given. Integration is the inverse of differentia-

Appendix 3

United States Surgical Corp. v. Ethicon Inc., 103 F.3d 1554, 41 U.S.P.Q.2d 1225, (Fed. Cir. 1997), *cert. denied*, 522 U.S. 950 (1997);

and

In re Young, 927 F.2d 588, 18 U.S.P.Q. 1089 (Fed. Cir. 1991)

**U.S. Court of Appeals
Federal Circuit**

United States Surgical Corp. v. Ethicon Inc.

Nos. 94-1386, -1419

Decided January 3, 1997

PATENTS

**1. Patentability/Validity — Obviousness —
In general (§115.0901)**

**JUDICIAL PRACTICE AND
PROCEDURE**

Procedure — Jury trials (§410.42)

Federal district court properly instructed jury on issue of obviousness in patent infringement action, since jury was correctly instructed on presumption of validity and that defendant bore burden of proving invalidity by clear and convincing evidence, and that it was necessary to consider scope and content of prior art, differences between prior art and claimed invention, level of ordinary skill in art, and objective criteria of non-obviousness, since instructions included explanation of principles to be applied in determining obviousness when invention is combination of prior art components, and since instructions were correct in law, thorough, and clearly stated.

PATENTS

**2. Patentability/Validity — Obviousness —
In general (§115.0901)**

**Patent construction — Claims — In general
(§125.1301)**

Federal district court need not repeat or restate every claim term in order to comply with rule that claim construction is for court rather than jury; since claim construction is matter of resolution of disputed meanings and technical scope, to clarify and if necessary explain what patentee covered by claims, for use in determination of infringement, rather than obligatory exercise in redundancy; although claim construction may occasionally be necessary in obviousness determinations, when meaning or scope of technical terms and words of art is unclear and requires resolution in order to determine obviousness, in present case none of rejected jury instructions concerning claim construction was directed to, or has been reasonably shown to affect, determination of obviousness.

PATENTS

**3. Patentability/Validity — Obviousness —
In general (§115.0901)**

**JUDICIAL PRACTICE AND
PROCEDURE**

Procedure — Jury trials (§410.42)

Federal district court did not commit prejudicial error by providing dictionary to jury during its deliberations in patent infringement trial in which asserted claims were held invalid for obviousness, since district court explained in post trial opinion that jury instruction to consider ordinary meaning of claim language, and general assumption that definitions of dictionary are common knowledge with which jury is charged, support provision of dictionary, since provision of dictionary to jury, although not favored, is not grounds for new trial, and since plaintiff has offered no specifics as to words whose dictionary definitions may have adversely affected verdict of obviousness, and no suggestion that jury disregarded court's instructions on law of obviousness or plain meaning of terms used in claims and prior art.

PATENTS

**4. Patentability/Validity — Obviousness —
In general (§115.0901)**

**Patent construction — Claims — In general
(§125.1301)**

**JUDICIAL PRACTICE AND
PROCEDURE**

Procedure — Jury trials (§410.42)

Federal district court's rejection of proposed jury instructions directed to construction of patent claims did not prejudice jury's determination of obviousness, since district court is not required to parse claims for jury, in every case, whether or not there is issue in material dispute as to meaning or scope of claims, since infringement plaintiff has not shown that there are unclear or ambiguous technical terms or words of art or related aspects of claim scope whose "construction" would negate verdict of obviousness, and has not explained how any reasonable claim construction it requested would have deprived obviousness verdict of its support, and since trial court is not authorized to remove from jury factual findings underlying obviousness determination.

Particular patents — General and mechanical — Surgical clip application

5,084,057, Green, Bolanos, Young, McGarry, Heaton, and Ratcliff, apparatus

ent Order revises the reference to the date of copyright restoration Uruguay Round Agreements Act the Court's August 19, 1996 USPQ2d 1506] granting plaintiff for Partial Summary Judgment August 19, 1996 Order, the ed to Presidential Proclamation of December 23, 1994 (60 Fed. Jan. 4, 1995)) to conclude that restoration for URAA works was 1995. See Order at pages 13, 16. r Presidential document, Proclamation 6780 of March 23, 1995 (60 Fed. (March 27, 1995)) clarifies that of the Uruguay Round Agreement-Related Aspects of Intellectual Rights (TRIPs) relating to restoration did not take effect until 1996. Proclamation No. 6780 tinent part at Section 5: e 65, paragraph 1, of the TRIPs it provides that no WTO member be obliged to apply to provisions reement until one year after the entry into force of the WTO it with respect to the United s January 1, 1995. statement of administrative aced by the Congress in section of the URAA (19 U.S.C.)) provides that, "in general, will be restored on the date Ps Agreement's obligations take the United States." dingly, I have decided that it is and appropriate, in order to imhe TRIPs Agreement and to ensection 514 of the URAA is tely implemented, to proclaim ate on which the obligations of s Agreement will take effect for d States is January 1, 1996. n No. 6780 of March 23, 1995. g. 15845 (March 27, 1995)). t emphasizes that the present does not affect the Court's Au-6 ruling.

ORDERED.

and method for applying surgical clips in laparoscopic or endoscopic procedures, judgment that claims 1, 2 and 7 are invalid for obviousness affirmed.

5,100,420, Green, Bolanos, Young, McGarry, Heaton, and Ratcliff, apparatus and method for applying surgical clips in laparoscopic or endoscopic procedures, judgment that claim 1 is invalid for obviousness affirmed.

On remand from the U.S. Supreme Court. Action by United States Surgical Corp. against Ethicon Inc. and Johnson & Johnson Hospital Services Inc. for patent infringement. The U.S. District Court for the District of Connecticut entered judgment for defendants on jury verdicts that plaintiff's patent no. 5,100,420 is infringed but invalid for obviousness, and that plaintiff's patent no. 5,084,057 is not infringed and invalid for obviousness. On appeal, the U.S. Court of Appeals for the Federal Circuit affirmed without opinion pursuant to Fed. Cir. R. 36. Following grant of certiorari, the U.S. Supreme Court vacated that affirmance and remanded for further consideration in light of its decision in *Markman v. Westview Instruments Inc.* (38 USPQ2d 1461). On remand, district court's judgment is affirmed on ground of invalidity of patents in suit based on obviousness.

William E. McDaniels, J. Alan Galbraith, and David S. Blatt, of Williams & Connolly, Washington, D.C.; Basam E. Nabulsi, Thomas R. Bremer, and John C. Andres, Norwalk, Conn., for plaintiff-appellant.

David F. Dobbins, Gregory L. Diskant, and Eugene M. Gelernter, of Patterson, Belknap, Webb & Tyler, New York, N.Y., for defendants/cross-appellants.

Before Newman, circuit judge, Bennett, senior circuit judge, and Rader, circuit judge.

Newman, J.

The court's prior judgment of this appeal and cross-appeal was vacated by the Supreme Court and remanded "for further consideration in light of *Markman v. Westview Instruments, Inc.*, 517 U.S. _____ (1996)." *U.S. Surgical Corp. v. Ethicon, Inc.*, 116 S. Ct. 1562 (1996). Our prior judgment affirmed the judgment of the United States District Court for the District of Connecticut, entered on jury verdicts that claim 1 of

U.S. Surgical's United States Patent No. 5,100,420 (the '420 patent) is infringed but invalid for obviousness, and that claims 1, 2, and 7 of United States Patent No. 5,084,057 (the '057 patent) are not infringed and are invalid for obviousness. The issue of inequitable conduct during patent prosecution was decided before trial, by summary judgment in favor of U.S. Surgical. Each of U.S. Surgical and Ethicon appealed the rulings adverse to it. After full briefing and oral argument, this court entered judgment pursuant to Federal Circuit Rule 36:

Rule 36: Judgment of affirmance without opinion.—

The court may enter a judgment of affirmance without opinion, citing this rule, when it determines that any of the following circumstances exist:

(a) the judgment, decision or order of the trial court appealed from is based on findings that are not clearly erroneous;

(b) the evidence in support of a jury verdict is sufficient;

(c) summary judgment, directed verdict, or judgment on the pleadings is supported by the record;

(d) the decision of an administrative agency warrants affirmance under the standard of review in the statute authorizing the petition for review; or

(e) a judgment or decision has been entered without an error of law;

and an opinion would have no precedential value.

Appeals whose judgments are entered under Rule 36 receive the full consideration of the court, and are no less carefully decided than the cases in which we issue full opinions. The Rule permits the court to dispense with issuing an opinion that would have no precedential value, when the circumstances of the Rule exist. See *Taylor v. McKeithen*, 407 U.S. 191, 194 n.4 (1972) ("We, of course, agree that the courts of appeals should have wide latitude in their decisions of whether or how to write opinions. That is especially true with respect to summary affirmances.")

Seven weeks after this decision, reported at 48 F.3d 1237 (Fed. Cir. 1995) (Table), for which rehearing and rehearing *en banc* were denied, the Federal Circuit decided *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 34 USPQ2d 1321 (Fed. Cir. 1995) (*en banc*). The Supreme Court granted certiorari in *Markman* and also upon U.S. Surgical's petition. After deciding the *Markman* appeal, reported at 517 U.S. 116 S. Ct. 1384, 38 USPQ2d 1461 (1996), the Court instructed the Federal Circuit to give further consideration to U.S. Surgical's case in light of the

¹ *U.S. Surgical Corp. v. Ethicon, Inc.*, No. 5:92 CV 00134 (AVC), (D. Conn. Feb. 11, 1993 (Summary Judgment); February 18, 1994 (Judgment Order); June 9, 1994 (Ruling on Post-trial Motions)).

s United States Patent No. '420 patent). is infringed but obviousness, and that claims 1, 2, 1 States Patent No. 5,084,057 (at) are not infringed and are obviousness. The issue of inequitable patent prosecution was trial, by summary judgment Surgical. Each of U.S. Surgical appealed the rulings adverse briefing and oral argument ed judgment pursuant to Fed. 36:

judgment of affirmance with-

may enter a judgment of without opinion, citing this t determines that any of the cumstances exist:

gment, decision or order of rt appealed from is based on are not clearly erroneous; idence in support of a jury ficient;

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judgments are entered under : the full consideration of the o less carefully decided than ch we issue full opinions. The ie court to dispense with issu- hat would have no preceden- n the circumstances of the : *Taylor v. McKeithen*, 407 n.4 (1972). ("We, of course, courts of appeals should have their decisions of whether or ions. That is especially true summary affirmances.")

after this decision, reported (Fed. Cir. 1995) (Table), for g and rehearing *en banc* were leral Circuit decided *Mark- w Instruments, Inc.*, 52 F.3d d 1321 (Fed. Cir. 1995) (*en* reme Court granted certiora- and also upon U.S. Surgical's deciding the *Markman* ap- t 517 U.S., 116 S. Ct. 1384, 51 (1996), the Court instruct- Circuit to give further consid- Surgical's case in light of the

Court's decision in *Markman*. We have done so.

The judgment of the district court is affirmed, on the ground of invalidity of the '420 and '057 patents based on obviousness. We do not reach the issues of infringement and the conditional cross-appeal of the issue of inequitable conduct. See *Consolidated Aluminum Corp. v. Fosco Int'l Ltd.*, 910 F.2d 804, 814, 15 USPQ2d 1481, 1489 (1990) ("a party may defend a judgment 'on any ground properly raised below'") (citing *Washington v. Yakima Indian Nation*, 439 U.S. 463, 476 n.20 (1979)); *Lough v. Brunswick Corp.*, 86 F.3d 1113, 1123, 39 USPQ2d 1100, 1107 (Fed. Cir. 1996) ("No further public interest is served by our resolving an infringement question after a determination that the patent is invalid."). We now fully explain our decision.

The U.S. Surgical Inventions.

The inventions claimed in the '420 patent and its continuation-in-part the '057 patent are for a surgical instrument for ligating blood vessels and other tissues during endoscopic surgery, by applying multiple ligating clips in sequence.

Endoscopic surgery is a procedure where- by instead of opening the abdomen or other body cavity by incision to provide open access to the surgical site, the surgery is performed by inserting the surgical instruments into the body through small tubes called trocars. The small size of the incisions that accommodate the trocars results in less tissue damage, less pain, and faster healing than for traditional open surgery. In performing endoscopic surgery the body cavity is inflated with a gas, called "insufflating gas, to provide working space. For most procedures today a miniature video camera is used to televise the surgical site, the enlarged video image appearing upon an exter-

nal screen and guiding the surgeon or surgi- cal team in manipulating the instruments through the trocars.

Endoscopic surgery was in somewhat lim- ited use for many years, having been used mostly for the ligation of fallopian tubes, the surgeon viewing the site through an eyepiece. Endoscopic procedures experienced rapid expansion after about 1989, particularly for gallbladder removal. Witnesses disputed at trial whether the expansion was due to the development of the miniature video camera or the development of U.S. Surgical's endo- scopic multiple clip applier.

During both endoscopic and open surgery, blood vessels may be closed and tissues clamped using small "U" shaped clamps called ligating clips. Ligating clips are applied by an instrument that positions the clip about the tissue or vessel to be secured and then compresses the clip. When initially devel- oped, ligating clip instruments were capa- ble of being loaded with only one clip at a time, and required reloading between each application. Then U.S. Surgical developed a ligating clip applier for open surgical use that applied multiple clips in succession, without reloading the instrument. This in- strument, having the brand name "Premium Surgiclip," is the subject of United States Patent No. 5,030,226 (the '226 patent). The Premium Surgiclip and the '226 patent are prior art to the '420 and '057 patents in suit, and were the subject of extensive testimony at trial.

At trial witnesses explained the subse- quent development of the instrument of the patents in suit, a ligating clip applier for endoscopic use that applies multiple clips in succession without withdrawing and reload- ing the instrument. U.S. Surgical's instru- ment, having the brand name EndoClip, was the first multiple clip applier for endoscopic use. The instrument is depicted in the '420 patent as follows:

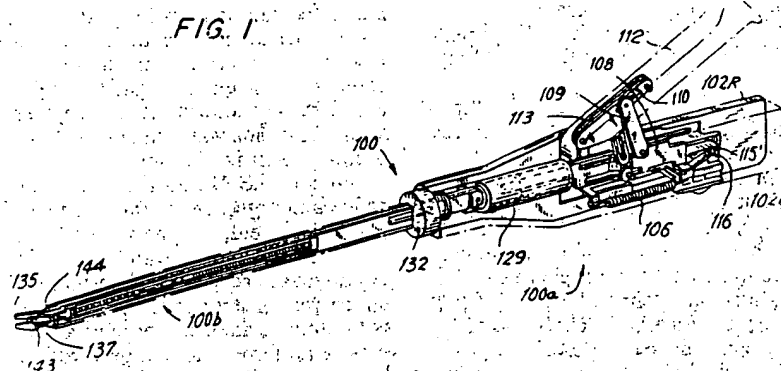


Fig. 1 of '420 patent.

The instrument is depicted in the '057 patent with a different handle, as follows:

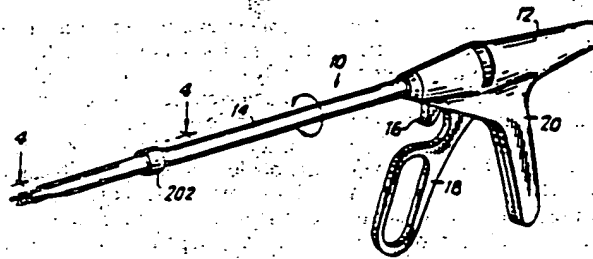


Fig. 1 of '057 patent.

It is seen that these instruments have an elongated shank that holds the ligating clips and is shaped for endoscopic use through a trocar. After insertion into the body cavity a clip is pushed into position in the jaws using controls on the handle, and the clip is applied to the tissue to be ligated by closing the jaws using controls on the handle. The jaws are then opened and the next clip is pushed into position. Thus successive clips may be applied without withdrawing the instrument from within the body.

Claim 1 of the '420 patent is directed to the combination of the trocar and the clip applier, each component having defined limitations. Claim 1 is the only '420 patent claim in suit:

1. In combination:

a) a trocar having a cannula, and valve means for sealing said cannula, said cannula being adapted for entry into a body cavity;

b) an endoscopic clip applier having:

i) a frame;

ii) an endoscopic portion defining a longitudinal axis and extending distally from said frame, said endoscopic portion being insertable into said cannula through said valve means in sealing engagement therewith, said endoscopic portion further including a plurality of surgical clips disposed in an array and clip closing means for sequentially closing said surgical clips; and

iii) seal means associated and adapted to cooperate with at least one of said endoscopic portion and said frame to obstruct passage of gaseous media from the body cavity.

Claim 1, the broadest claim of the '057 patent, also describes the endoscopic apparatus as comprising several elements. The claim elements are defined in terms of their function, as provided in 35 U.S.C. §112 ¶6:

1. An apparatus for endoscopic application of surgical clips to body tissue which comprises:

a) frame means;

b) endoscopic means connected to said frame means of generally elongated configuration and extending distally from said frame means and including:

i) means for storing a plurality of surgical clips;

ii) means for individually advancing said clips to the distal portion of said endoscopic means for positioning adjacent the body tissue to be clipped;

iii) means for at least partially closing said clip at least sufficient to grip the body tissue after the clip has been advanced distally to said distal portion of said endoscopic means; and

iv) gaseous sealing means.

Claim 2 of the '057 patent specifies the use of silicon grease as the gaseous sealing means of clause iv, and claim 7 is directed to a disposable device as in claim 1.

Ethicon's defense that the claims are invalid for obviousness was based on the ground that U.S. Surgical had merely adapted to endoscopic use its own, prior art multiple clip applier, the Premium Surgiclip of the '226 patent, by known and routine adaptation. Thus Ethicon presented evidence and argument that U.S. Surgical had simply elongated the body of its prior art multiple clip applier so that it could be used through a trocar, with a sealing means to prevent escape of the insufflating gas through the trocar. Ethicon adduced extensive evidence that such adaptation was well known to persons of ordinary skill in the field of endoscopic instruments. U.S. Surgical countered with evidence and argument to the contrary.

The jury held, by special verdicts, that the claims in suit were invalid for obviousness. On appellate review we determine whether, on correct instructions of law, there was substantial evidence whereby a reasonable jury could have reached the verdict reached by this jury. See *Litton-Sys., Inc. v. Honeywell, Inc.*, 87 F.3d 1559, 1566, 39 USPQ2d

1321, 11 evidence of evidence; ably aff ketsu K F.3d 85 Cir. 19 relevant as could adequat ing evid as resol favor th must giv choices between factual Motor (Fed. C function basis [o ent, it b draw a other, (quoting 653 (19 Inc., 79 (Fed. C (1987).

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 panying the denial of post-trial
 motions, that U.S. Surgical's
 technical expert testified that
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 different prior art multiple clip
 appliers for conventional open
 surgery. He testified that at
 least four of them — the
 Premium Surgiclip of the '226
 patent and the multiple clip
 appliers shown in the Montgo-
 mery patent, the Peters patent,
 and the Lachakar patent —
 embodied all of the elements of
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 elongated body and sealing
 means are characteristics of
 all endoscopic surgical instru-

1321, 1324 (Fed. Cir. 1996) ("Substantial evidence describes that minimum quantum of evidence from which a jury might reasonably afford relief."); *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 72 F.3d 857, 862, 37 USPQ2d 1161, 1163 (Fed. Cir. 1995) ("Substantial evidence is such relevant evidence, on the record as a whole, as could be accepted by a reasonable mind as adequate to support the verdict.") Conflicting evidence and argument must be viewed as resolved favorably to the party in whose favor the jury found. The reviewing court must give appropriate deference to the jury's choices in weighing the evidence, in deciding between opposing positions, and in drawing factual inferences. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989) ("the appellate court's function is exhausted when that evidentiary basis [of the jury's verdict] becomes apparent, it being immaterial that the court might draw a contrary inference or feel that another conclusion is more reasonable.") (quoting *Lavender v. Kurn*, 327 U.S. 645, 653 (1946)); *Medtronic, Inc. v. Inermedics, Inc.*, 799 F.2d 734, 742, 230 USPQ 641, 646 (Fed. Cir. 1986), cert. denied, 479 U.S. 1033 (1987).

The Prior Art

As we have remarked, Ethicon's position was that U.S. Surgical had simply elongated its prior art multiple ligating instrument so that it could be inserted through a trocar, and used known endoscopic sealing mechanisms to inhibit escape of the insufflating gas through the trocar. Expert witnesses testified that these modifications were well known to persons of ordinary skill in the art of endoscopic instruments. The witnesses presented several prior art patents, and exhibited many actual instruments, all having the common endoscopic characteristics of an elongated body and sealable engagement with the trocar.

The district court mentioned, in the opinion accompanying the denial of post-trial motions, that U.S. Surgical's technical expert testified that there were approximately forty different prior art multiple clip appliers for conventional open surgery. He testified that at least four of them — the Premium Surgiclip of the '226 patent and the multiple clip appliers shown in the Montgomery patent, the Peters patent, and the Lachakar patent — embodied all of the elements of the '420/'057 claims except for the elongated body and sealing means. He testified that an elongated body and sealing means are characteristics of all endoscopic surgical instru-

ments. In evidence were a variety of actual instruments for endoscopic surgery, all having these characteristics. These endoscopic instruments included graspers, scissors, dissectors, and single clip appliers. All had an elongated body and were adapted for sealing engagement with the trocar.

Also in evidence were references describing prior endoscopic devices for the application of multiple fasteners other than ligating clips. U.S. Patent No. 3,870,048 to Yoon showed an applier for multiple elastic rings for ligating fallopian tubes; stating that "[i]t is possible to load suture ring clips within the applicator in end-to-end series fashion."

This permits a number of clips to be applied during a procedure without the need of having to withdraw the applicator from the surgical field in order to load another clip into the applicator." U.S. Patent No. 4,226,239 to Polk also showed an instrument for endoscopic application of multiple ligating rings. The prior art also included at least one endoscopic multiple staple applier, Patent No. 4,944,443 to Oddsen. All of the endoscopic instruments for applying multiple fasteners had the common characteristics of elongation for use through a trocar, and most were sealed against escape of the gas through the trocar. Several references showed the use of silicon grease, as specified in claim 2 of the '057 patent, or valves, as specified in claim 1 of the '420 patent, to maintain the seal.

The testimony of U.S. Surgical's technical expert that the elongated body and the seal are common characteristics of endoscopic instruments was described by Ethicon as a concession of great weight. This evidence was stressed at trial, as Ethicon pressed its argument that U.S. Surgical had simply adapted its '226 patent multiple clip applier for endoscopic use, and that it was obvious to do so, pointing to many other instruments that had been adapted in the same way. U.S. Surgical points out that this same expert and several other expert witnesses testified about the difficulties of designing the '420/'057 endoscopic multiple clip applier and the time and cost involved. We take note of the conflicting testimony and the opposing expert opinions of witnesses for these parties, and of the lengthy explorations by these witnesses of this technology and the development and characteristics of these surgical instruments.

In comparing the '420/'057 instruments with the prior art instruments, Ethicon's patent expert testified that the prior art '226 patent was the closest prior art and that the relevant elements of the structure of the '226 patent "were adopted into the subject matter of the '057 and '420 patent applications."

Ethicon's technical expert pointed out to the jury all of the similarities of the structure and mechanisms between the device of the '226 patent and the '420/'057 patents. He pointed to the jaws to hold the clip, the pusher for advancing a stored clip to the

jaws, the grooves in the face of the jaws to receive the clip, and the mechanism for closing the clip about the tissue to be ligated. The drawings of the jaws in the '226 patent and in the '420/'057 patents show this similarity:

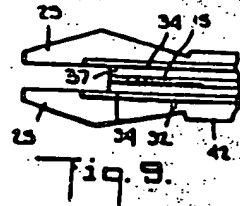


Fig 9 of 226 Patent

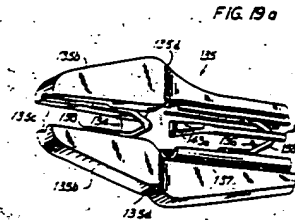


Fig 19a of 420 Patent

Witnesses testified that the operation of the '226 instrument and the '420/'057 patents was essentially the same. It was explained that in both the '226 and the '420/'057 instruments the jaw blade, clip carrier, and pusher bar are all enclosed in a channel assembly from which the jaws protrude at the end. In the '226 patent the applicator is described in the Abstract as:

The surgical clip applicator has a pusher bar which positions the foremost clip from a clip carrier into a ready-to-fire position between the jaws prior to squeezing of the handles together. When the applicator is fired, the previously positioned surgical clip can be crimped about a vessel and when the jaws are released, a new clip is placed between the jaws for the next firing. A channel assembly moves over the jaws to close the jaws while the pusher bar

is retracted into the clip carrier for delivering the foremost clip from the carrier upon release of the handles.

Referring to Fig. 4 of the '226 patent, it was explained at trial that the pusher bar (35) moves a clip (33) into the channels in the faces of the jaws (25). When a clip is in the jaws and the handles are closed, the external channel (38) moves forward over the beveled portion of the jaws, which, by virtue of their beveled shape, are squeezed together by the external channel, thus closing the clip. At the same time, the pusher bar moves back to engage the next clip in line. When the handle is released the channel withdraws, the jaws open and release the clipped tissue, and the pusher bar moves forward, positioning the next clip into the jaws. The operating components are shown in the patent as follows:

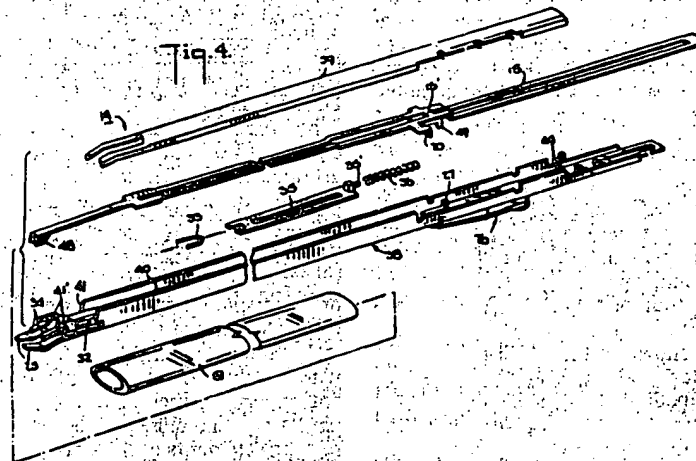


Fig. 4 of 226 Patent

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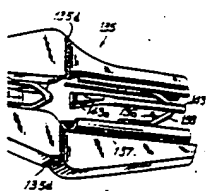
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grooves in the face of the jaws to clip, and the mechanism for closing about the tissue to be ligated. Figures of the jaws in the '226 patent and '420/'057 patents show this

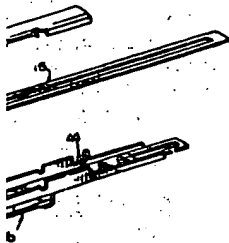
FIG. 19a



f 420 Patent

ed into the clip carrier for delivery. The most clip from the carrier upon the handles.

o Fig. 4 of the '226 patent, it was at trial that the pusher bar (35) ip (33) into the channels in the jaws (25). When a clip is in the e handles are closed, the external (b) moves forward over the beveled he jaws, which, by virtue of their ipe, are squeezed together by the annel, thus closing the clip. At the e the pusher bar moves back to next clip in line. When the handle the channel withdraws, the jaws elease the clipped tissue, and the moves forward, positioning the to the jaws. The operating compo- hown in the patent as follows:



In the '226 patent the clip carrier is described as "an elongated channel having a pair of side walls or rails between which the clips are slidably guided, a pusher which

slides between the rails, and a spring for biasing the pusher in the forward direction." Col. 4, lines 45-54. The corresponding assembly, shown in Fig. 18 of the '420 patent, was the subject of comparative testimony:

FIG. 18

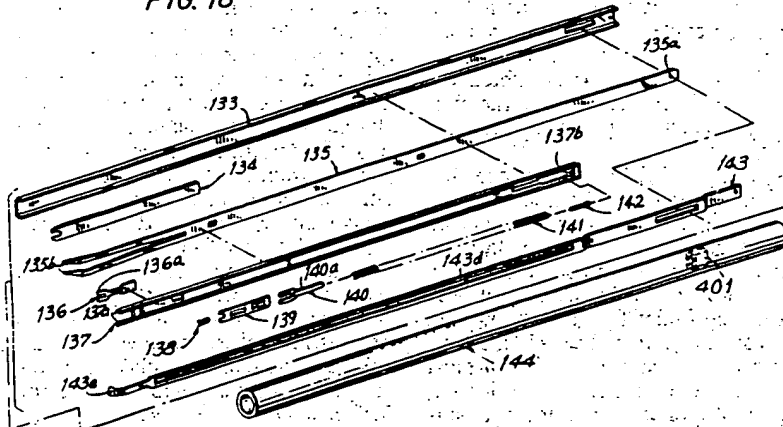


Fig 18 of 420 Patent

It was explained that the pusher bar (143) moves a ligating clip (138) into the channels in the faces of the jaws (135-b). When a clip is in the jaws and the handles are closed, the external channel (133) moves forward over the beveled portion of the jaws, squeezing them together and closing the clip.

To counter this evidence of similarity, U.S. Surgical witnesses testified that the '420/'057 instrument was not a routine adaptation of a prior instrument, and stressed the long development time and engineering difficulties involved in the conversion of the '226 device to endoscopic use. Ethicon challenged these arguments and their factual basis on cross-examination, and elicited testimony that the development time related primarily to unclaimed features of the handle.

There was testimony about the seal and how it was achieved. In its infringement case U.S. Surgical argued that "valve means" in the '420 patent included any known means for sealing the clip applicator in the trocar, including valves and gaskets. U.S. Surgical argued at trial as stated in its proposed jury instruction construing this term for infringement purposes:

The structure for performing this [valve means] function includes all such structures contained in trocars known in the art at the time the '420 Patent Application was filed.

U.S. Surgical presented testimony to this effect at trial, thus providing substantial ba-

sis for the jury to find that the "valve means" of the '420 patent was known in the prior art. U.S. Surgical does not now dispute that the "valve means" of its '420 patent is found in prior art endoscopic instruments.

In the course of the extensive explanation and comparisons at trial of the prior art devices and the '420/'057 devices, there was no dispute concerning the content of the references or the structures that they described. There was no dispute concerning the structures described in the '420/'057 patents, or concerning the meaning of technical terms or words of art as used in the prior art or in the patents in suit. The jury was instructed that the technical terms had their plain meaning, as the district court mentioned in its opinion on the post-trial motions. U.S. Surgical did not proffer a particular "construction" of technical terms in order to distinguish the claimed inventions from prior art devices. Neither party departed from the plain meaning of the words that were used in the claims and in the specifications, and in the prior art. Although U.S. Surgical has raised, on this appeal the issue of "claim construction," as we shall discuss *post*, there was no argument at trial as to the meaning of technical terms or words of art insofar as they concern the determination of obviousness.

There was opinion evidence on both sides of the question of obviousness. We turn to the objective factors, for as the district court instructed the jury, such evidence must be

considered in the determination of obviousness:

Objective Factors

Objective factors assist in understanding how the invention was viewed in its field of endeavor, and provide an important practical guide to the decisionmaker. It was explained to the jury that the context in which the invention arose and its reception in the marketplace are indicia of unobviousness, and must be considered.

Witnesses for U.S. Surgical testified that the EndoClip, a commercial embodiment of the '420/'057 patents, had revolutionized endoscopic surgery and made endoscopic gall bladder removal possible. Its commercial success was emphasized, and it was stressed that the EndoClip was the first and for some years the only endoscopic multiple clip applier on the market. U.S. Surgical pointed out that the most relevant prior art, viz. single clip appliers for endoscopic surgery and multiple clip appliers for open surgery, had existed for more than a decade before U.S. Surgical produced the EndoClip for endoscopic surgery. U.S. Surgical presented evidence of the rapid acceptance and adoption of new endoscopic procedures, based on its new multiple clip applier.

Witnesses for Ethicon testified that the growth of endoscopic surgery was due to the miniature video camera, not the multiple clip applier. They testified that before a tiny camera was available to televise images of the abdominal cavity, whereby a team of surgeons could operate with a common view of the surgical field, endoscopic surgery was largely limited to ligation of fallopian tubes; a simple procedure performed by a surgeon peering through an eyepiece. According to Ethicon, U.S. Surgical's EndoClip was developed for and had its only use for tubal ligation, and its later commercial growth was due to the sheer luck of being on the market when endoscopic surgery underwent its rapid expansion upon the capability of televising from inside the body.

Thus U.S. Surgical characterized its '420/'057 multiple clip applier as a pioneering advance in the field of endoscopic surgery, while Ethicon described the '420/'057 instrument as an obvious adaptation of a prior art multiple clip applier, whose commercial success was due to unrelated factors. These conflicting arguments were fully presented at trial. Witnesses, including surgeons, supported both sides. The jury was presented with questions of credibility and weight as well as factual disputes, as the jury decided whether the inventions of the claims

in suit would have been obvious to a person of ordinary skill in the field of the invention at the time the invention was made. Although there were indeed questions of credibility and weight of evidence, the jury was not required to choose between alternative meanings of technical terms or words of art, or decide the scope of the claims, in deciding the question of obviousness. The factual findings of the scope and content of the prior art, the differences between the prior art and the claimed invention, the level of ordinary skill in the field of the invention, and the objective considerations, did not require "construction" of these claims as set forth in the *Markman* decisions of the Federal Circuit and the Supreme Court.

In reviewing the jury verdict of obviousness, we review whether the jury was correctly instructed on the law, and whether there was substantial evidence whereby a reasonable jury could have reached its verdict upon application of the correct law to the facts, *Railroad Dynamics, Inc. v. A. Stucki Co.*, 727 F.2d 1506, 1512, 220 USPQ 929, 935-36 (Fed. Cir.), cert. denied, 469 U.S. 871 (1984), recognizing that invalidity must be proved by clear and convincing evidence: *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893, 221 USPQ 669, 673 (Fed. Cir. 1984). Thus we turn to the law, as presented at trial and as instructed by the trial judge.

The Jury Instructions

Jury instructions are reviewed for correctness, with due attention to their clarity, objectivity, and adequacy, taken as a whole. See *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1570, 24 USPQ2d 1401, 1411 (Fed. Cir. 1992) ("The correctness of a jury instruction is reviewed on appeal to determine whether, on the whole, the jury instructions were adequate to ensure that the jury fully understood the legal issues for each element of the case."); *Trademark Research Corp. v. Maxwell Online, Inc.*, 995 F.2d 326, 339 (2d Cir. 1993) ("A trial court's improper charge constitutes reversible error only when jury instructions, taken as a whole, give the jury a misleading impression or inadequate understanding of the law.") (quoting *Carvel Corp. v. Diversified Management Group, Inc.*, 930 F.2d 228, 232 (2d Cir. 1991)).

[1] The jury was correctly instructed on the presumption of validity, and that Ethicon bore the burden of proving invalidity by clear and convincing evidence. The jury was correctly instructed that in determining whether the inventions of the '420 and '057 patents

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have been obvious to a person of ordinary skill in the field of the invention at the time the invention was made. Although numerous questions of credibility of evidence, the jury was not to choose between alternative technical terms or words of art, the scope of the claims, in deciding if obviousness. The factual findings of the prior art, the differences between the prior art and the invention, the level of ordinary skill in the art, and the objective evidence, did not require "construction" of the claims as set forth in the instructions of the Federal Circuit en banc.

In the jury verdict of obviousness, whether the jury was correct on the law, and whether there was sufficient evidence whereby a reasonable person would have reached its verdict upon the correct law to the facts, *Amicus, Inc. v. A. Stucki Co.*, 515 F.2d 1555, 1570, 24 USPQ2d 888, 893, 221 USPQ 669, 671 (CA-7, 1975), cert. denied, 469 U.S. 871 (1984). Thus we turn to the instructions given at trial and as instructed by the court.

Instructions

The instructions are reviewed for correctness, clarity, and adequacy, taken as a whole. *Corp. v. Advanced Micro Devices, Inc.*, 753 F.2d 1555, 1570, 24 USPQ2d 888, 893, 221 USPQ 669, 671 (CA-7, 1984). ("The correctness of the instruction is reviewed on the whole, whether, on the whole, the instructions were adequate to ensure a full and complete understanding of the legal issues presented by the case."); *Trademark v. Maxwell Online, Inc.*, 995 F.2d 1555, 1570, 24 USPQ2d 888, 893, 221 USPQ 669, 671 (CA-7, 1993). ("A trial per se does not constitute reversible error when jury instructions, taken as a whole, do not mislead or misstate the law or create an inadequate understanding of the legal issues presented by the case. *Carvel Corp. v. Diversified Group, Inc.*, 930 F.2d 228, 232 (CA-7, 1992).")

The jury was correctly instructed on the issue of validity, and that Ethicon was not to prove invalidity by clear and convincing evidence. The jury was correct in determining whether the '420 and '057 patents

were invalid based on obviousness, it was necessary to consider the scope and content of the prior art, the differences between the prior art and the claimed invention, the level of ordinary skill in the art, and the objective evidence. The court correctly explained the *Graham* factors. See *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). For example, in determining the level of ordinary skill in the art, the jury was instructed to consider:

evidence submitted by the parties to show:

One, the educational level of active workers in the field;

Two, the types of problems encountered in the art;

Three, the nature of the prior art solutions to those problems;

Four, the activities of others;

Five, the rapidity with which innovations are made in the art;

And six, the sophistication of the technology involved.

The jury instructions included explanation of the principles to be applied in determining obviousness when the invention is a combination of prior art components. The court instructed that the prior art must show not only all of the elements of the claimed combination, but must contain some "teaching, suggestion or incentive" to a person of ordinary skill to combine the known elements in the way that U.S. Surgical combined them:

In order to prove obviousness, the defendants must prove, again by clear and convincing evidence, that one of ordinary skill in the art would have found in the prior art references some teaching, suggestion or incentive to combine the prior art references in the way that U.S. Surgical did in its invention.

The jury instructions stressed that the prior art, to be invalidating, must sufficiently teach or direct a person of ordinary skill how to obtain the result reached by the patentee:

Additionally, if you do find a teaching in the prior art that would motivate one of ordinary skill in the prior art to make the clip applier claimed in the '057 and '420 patents, you must also determine whether there was sufficient teaching or direction in the prior art of how to obtain or build the claimed clip applier such that a person of ordinary skill in the art would have a reasonable likelihood of success in making the invention. In other words, in order to find obviousness, you must find not only that the prior art would teach one of ordinary skill to try the combination of known elements, but also that the prior art would

sufficiently teach or direct one of ordinary skill how to obtain the desired result.

The jury was instructed that in determining obviousness it was to consider the claim as a whole, and that it did not suffice if the individual elements of the invention were known in the prior art:

The reason you must consider the claim as a whole is because there is no dispute that U.S. Surgical's invention is comprised of individual elements which were known in the prior art. The fact that U.S. Surgical's inventions incorporate or combine elements already known in the prior art does not render its patents invalid. Patents can be granted on devices that contain a combination of various elements that are well known in the prior art. U.S. Surgical's claim is that it invented the combination of those elements for the first time in the endoscopic multiple clip applier claimed in the patents in suit.

The instructions on the law of obviousness occupied eight pages of trial transcript. They were correct in law, thorough, and clearly stated. U.S. Surgical now argues that other instructions that it requested should also have been given, and that their omission requires a new trial. The district court explained its denial of these requests in its opinion on the post-trial motions.

U.S. Surgical had requested that the court read to the jury the sentence of 35 U.S.C. §103(a) that states: "Patentability shall not be negated by the manner in which the invention was made," accompanied by the instruction that the jury should give no weight to Ethicon's evidence of "how long or short a time it took to make [the invention]" and "how obvious U.S. Surgical's invention may have seemed to U.S. Surgical's own inventors." The court denied the request. We do not discern reversible error in this denial, for the rejected instruction was encompassed in the instructions that were given, was the subject of expert testimony, and was included in the argument. The court did not commit error in denying an instruction that gave weight to one of the several aspects that were before the jury, and was reasonably viewed as cumulative in the context of the instructions that were given.

U.S. Surgical also requested an instruction that the '226 patent was cumulative prior art and thus did not have to be cited to the patent examiner. In its pre-trial consideration of the issue of inequitable conduct the court, through a special master, had concluded that the '226 patent was cumulative in the circumstances and on the law that then applied in the examination of patents. Whatever the relevance of this point to the issue of

inequitable conduct, which had been decided in favor of U.S. Surgical, the '226 patent was correctly treated as prior art in this litigation. The denial of this instruction is not grounds for a new trial.

U.S. Surgical also requested the instruction that even if the jury found the absence of the secondary consideration of long-felt need, that was "in no way suggestive of obviousness or invalidity." The instruction that was given on the secondary considerations was:

In making these three determinations [the *Graham* factors] you must also consider other surrounding circumstances which are called secondary considerations. These include:

One, whether the alleged invention was commercially successful;

Two, whether the alleged invention satisfied a long-felt need in the art;

Three, whether others were unsuccessful in making the alleged invention;

Four, whether the alleged invention was copied by others in the art;

Five, whether the alleged invention received praise from others in the art;

Six, whether the alleged invention departed from other principles of the art.

In order to determine that secondary considerations such as commercial success are evidence of non-obviousness, there must be a causal connection between the patented features of the invention and the commercial success of the device. If commercial success is attributable to the patented features, then it is evidence of non-obviousness.

U.S. Surgical's requested instruction concerning long-felt need related to the weight to be given to a fact whose existence, and significance, was disputed at trial. The issue of the objective factors was complex and hard-fought at trial, leaving areas of dispute, weight, and perhaps credibility. We discern no error in the court's refusal to comment on a specific aspect, having instructed the jury on all aspects.

U.S. Surgical also requested the instruction that prior art that teaches away from the patented invention is evidence of nonobviousness. That subject was comprehended in the above-quoted instruction that the jury should consider "Six, whether the alleged invention departed from other principles of the art," an argument whose substance had been debated at trial. The refusal of this instruction, in light of the full instructions that were given, is not grounds for a new trial.

U.S. Surgical also states that the district court should have given a curative instruc-

tion to counter Ethicon's suggestion that the patents in suit improperly hindered competition. The record shows Ethicon's persistent and improper innuendos. However, U.S. Surgical reasonably countered this aspect with evidence and argument concerning the purpose of the patent system. Review of the record leads us to conclude, as apparently did the district court, that this tactic did not prejudice the outcome. See *City of New York v. Pullman, Inc.*, 662 F.2d 910, 917 (2d Cir. 1981) ("The district court is not obliged to charge every contention made by the parties at trial, as long as the charge itself, taken as a whole, is fundamentally fair.") (citations omitted), cert. denied, 454 U.S. 1164 (1982). The denial of these instructions (and others offered by both sides) was not a miscarriage of justice, and does not establish reversible error or grounds for a new trial.

U.S. Surgical also argued that its requested instructions construing the claims should have been given, and that the absence of "claim construction" by the district court required a new trial. In accordance with the Court's remand for further consideration in light of *Markman*, we have again reviewed the requested instructions to determine whether any instructions that were improperly refused could reasonably have prejudiced the jury's verdict of invalidity.

In evaluating the refused instructions, we look first at the instructions on claim construction that were given. The issue was interpretation of these means-plus-function claims and their application to find if there was infringement by the Ethicon devices. The district court instructed the jury how to interpret means-plus-function claim elements, and how to apply these claim elements to the accused devices, as follows:

Now, in interpreting the means plus function claim elements, you must determine the following:

One, what function is called for by the claim element, and

Two, what structure, or means, is described in the patent specifications for performing the stated function.

A means plus function claim is only infringed if:

One, the function of the accused device is identical to the function disclosed in the claim element of the patent; and

Two, the structure which performs that function in the accused device is the same as, or the equivalent of, the structure described in the patent specifications.

The second of these two steps requires you to determine whether the accused device includes the same structure as described in the patent or its equivalent. You

may determine that the prior art would change the patent's scope. This aspect of validity in this case states that A to perform the function, that is the structure, an analysis for instruction; flawed the instructions the '057 proposed claim. Clause "means plus function" element. interpret it, it clips. We observe claim construction of the claim told the jury the patent function:

The structure of the patent is function array of the clips instrument.

This information solved no problem, the request find infringement the general given, particularly to the

In order the '05 first find perform of clips defend track clips at the dis equivalent function

This text, same work undisputed. The request the accused

r Ethicon's suggestion that the improperly hindered competitor shows Ethicon's persistent innuendos. However, U.S. notably countered this aspect and argument concerning the patent system. Review of the us to conclude, as apparently t court, that this tactic did not outcome. See *City of New an, Inc.*, 662 F.2d 910, 917 (2d The district court is not obliged y contention made by the par- long as the charge itself, taken s fundamentally fair.") (cita- t, cert. denied, 454 U.S. 1164 enial of these instructions (and y both sides) was not a mis- justice, and does not establish or grounds for a new trial. al also argued that its request- s construing the claims should ven, and that the absence of uction" by the district court v trial. In accordance with the id for further consideration in man, we have again reviewed l instructions to determine nstructions that were improv- could reasonably have preju- s verdict of invalidity. ig the refused instructions, we he instructions on claim con- were given. The issue was of these means-plus-function air application to find if there ent by the Ethicon devices. ert instructed the jury how to ans-plus-function claim ele- ow to apply these claim ele- ccused devices, as follows: interpreting the means plus im elements, you must deter- lling: t function is called for by the nt, and it structure, or means, is de- the patent specifications for the stated function. plus function claim is only function of the accused device o the function disclosed in the nt of the patent; and structure which performs that he accused device is the same quivalent of, the structure de- ie patent specifications: id of these two steps requires mine whether the accused de- s the same structure as de- e patent or its equivalent. You

may determine that a structure in the Ethicon device is equivalent if you determine that a person of ordinary skill in the art would consider the structure found in the accused device an insubstantial change from the structure disclosed in the patent specification.

This aspect did not concern, or determine, validity in this case. However, U.S. Surgical states that *Markman* requires the trial judge to perform the first portion of this instruction, that is, to determine the function and the structure or means that performs the function, and to give a detailed technical analysis for the infringement portion of the instruction; and that failure to do so fatally flawed the trial.

For example, U.S. Surgical requested instructions for the first element of claim 1 of the '057 patent, starting with the following proposed claim construction:

Clause i) of claim element 1b) reads "means for storing a plurality of surgical clips." This is a means-plus-function claim element. The stated function, as I interpret it, is to store a plurality of surgical clips.

We observe that this part of the proposed claim construction merely repeats the words of the claim. The requested instruction then told the jury what structure was described in the patent specification for performing this function:

The structure or means disclosed in the patent specification for performing this function is a clip track which holds an array of surgical clips and a spring to bias the clips toward the distal or far end of the instrument.

This information from the specification resolved no dispute, for there was none. Next, the requested instruction told the jury how to find infringement: the same instruction as in the general jury instruction that was actually given, quoted *supra*, but now drawn specifically to this claim element:

In order to find that this claim element of the '057 patent has been met, you must first find that defendants' accused devices perform the function of storing a plurality of clips. Then you must find that the defendants' accused devices have a clip track which holds an array of surgical clips and a spring to bias the clips toward the distal or far end of the instrument, or equivalent structure, which performs this function.

This text, again, repeated the function in the same words as in the claim, and repeated the undisputed description in the specification. The requested instruction then stated that if the accused devices perform this function,

using the described means or an equivalent means, there is infringement. That is the same instruction as in the general instruction that was actually given, but made specific to this claim element. We doubt that *Markman* requires the trial judge to instruct as to an undisputed "claim construction" for every term, by simply parroting the words of the claim and then repeating the rule concerning infringement of means-plus-function claims. *Markman* explicitly recognized that the application of the claim to the accused device was for the jury. Indeed, Ethicon objected to this instruction as an improper attempt to direct the jury findings of infringement.

Similar instructions were proffered for the other claim elements. Another rejected instruction started with a similar repetition of the words of the claim as "interpreted" by the judge, and an undisputed restatement of what these words mean:

The final clause of claim element b) ii) calls for "clip closing means for sequentially closing said surgical clips." This is a means-plus-function claim element. The stated function of this particular means-plus-function claim element is "sequentially closing said surgical clips." I interpret this to mean the closing of surgical clips one at a time and one after the other.

In the infringement trial, the issue was not the definition of "sequentially," but the equivalency of the means that was described in the specification with the means that was used in the accused device, and issues concerning the clip advancing means. These aspects do not relate to obviousness, but to infringement. The additional text of this proposed instruction was objected to on its merits by Ethicon as an incorrect application of the law of 35 U.S.C. §112 ¶6. However, this aspect raised no disputed issues with respect to the determination of obviousness in view of the prior art. The dispute concerning the requested instructions related not to the prior art, but to the accused Ethicon devices.

Following is another claim element whose proffered "interpretation" was to repeat the words of the claim:

Claim element a) calls for a trocar having a cannula with valve means for sealing the cannula. The claim element "valve means for sealing said cannula" is a means-plus-function claim element. The stated function, as I interpret it, is to seal the cannula.

There were infringement disputes concerning the valve means, and there was much debate at trial concerning the scope of this claim element as applied to Ethicon's devices. U.S. Surgical requested the instruction that the "valve means" includes and is infringed by all prior art valves and gaskets

and any other known structures for sealing the cannula:

The structure for performing this function includes all such structures contained in trocars known in the art at the time the '420 Patent Application was filed. Such trocars contain structures both to seal the cannula when no instrument is in the cannula, such as a flapper-type valve, and structures which form a seal between the instrument and the cannula when an instrument is inserted in the cannula, such as a gasket. The flapper valve may engage the gasket, as in the U.S. Surgical Surgiprot Trocar, or be separate from the gasket, as in reusable instruments that were known at the time the '420 Patent Application was filed. Therefore, if you find that the Ethicon Endopath Trocar is a trocar having the same or equivalent structure to the structures I have just described, then the accused devices satisfy claim element a) of Claim 1 of the '420 Patent.

We referred *supra* to this requested instruction, for it makes clear that validity of the U.S. Surgical patents was not grounded on asserted unobviousness of the valve means, and that a reasonable jury could have so found. The district court had left to the jury the issue of breadth of the valve means as it affected infringement, for Ethicon had vigorously objected to this instruction as prejudging the finding of infringement. In his post-trial opinion, the district judge expressed the view that the jury had accepted U.S. Surgical's construction of the valve means since it found infringement of the '420 patent claim. We do not reach the issue of infringement. However, whether the valve means was construed as broadly as U.S. Surgical requested, or quite narrowly as Ethicon had argued, the variety of valve structures shown in the prior art was in accordance with the jury's finding of obviousness in light of the prior art.

[2] The *Markman* decisions do not hold that the trial judge must repeat or restate every claim term in order to comply with the ruling that claim construction is for the court. Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy. Although claim construction may occasionally be necessary in obviousness determinations, when the meaning or scope of technical terms and words of art is unclear and in dispute and requires resolution in order to determine obviousness, in this case none of these rejected instructions was di-

rected to, or has been shown reasonably to affect, the determination of obviousness.

Grounds for a new trial have not been shown. See *Santa Maria v. Metro-North Commuter R.R.*, 81 F.3d 265, 273 (2d Cir. 1996). ("A new trial must be granted if the court determines that the verdict is against the weight of the evidence, that the damages are excessive, or that, for other reasons, the trial was not fair to the party moving.") (quoting *Montgomery Ward & Co. v. Duncan*, 311 U.S. 243, 251 (1940)); *Shatterproof Glass Corp. v. Libbey-Owens-Ford Co.*, 758 F.2d 613, 626, 225 USPQ 634, 643 (Fed. Cir. 1985). ("If prejudicial error occurred, or if the verdict is against the clear weight of the evidence, as an alternative to judgment n.o.v. a new trial may be granted, in the discretion of the trial judge.") (citing *Fairmont Glass Works v. Cub Fork Coal Co.*, 287 U.S. 474 (1933)).

We have not been shown prejudicial error in the jury instructions, or that the verdict of obviousness is against the clear weight of the evidence, or that substantial justice requires that the trial be voided.

The Dictionary

During its deliberations the jury requested a dictionary and, over the objections of both parties, was provided one by the court. U.S. Surgical states this is reversible error, while Ethicon states that any error was harmless.

U.S. Surgical proposes that the jury might have used the dictionary to look up definitions on which it had been instructed by the court or that had been explained by witnesses, such as "presumption" or "obviousness." The jury was instructed, as the parties agreed, to consider the ordinary meaning of the language used in the claims. U.S. Surgical does not mention any terms that were used outside of their ordinary meaning. The district court pointed out in its post-trial opinion that the instruction to consider the ordinary meaning, and the general assumption that definitions in a standard dictionary are common knowledge with which the jury is charged, support the provision of the dictionary.

[3] It is generally agreed that the provision of a dictionary to a jury, although not favored, is not grounds for a new trial. See *Wernsing v. General Motors Corp.*, 470 A.2d 802, 806 (Md. 1984). ("It appears to be the near universal consensus that a new trial is not awarded simply because a dictionary was before the jury.") (citing cases). U.S. Surgical offered no specifics as to words whose dictionary definitions may have adversely affected the verdict of obviousness.

Instead, U.S. of prejudice.

Both side F.2d 777 (2 troling law side argues In *Weiss* a of mail fra and the jur out the ju though the tra-record attention o cial," 752. the trial ju mation has not an abu conviction

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berations the jury requested; over the objections of both divided one by the court. U.S. his is reversible error, while at any error was harmless. proposes that the jury might dictionary to look up definition had been instructed by the ad been explained by witness "presumption" or "obvious" was instructed, as the parties for the ordinary meaning of ad in the claims. U.S. Surtinjection any terms that were their ordinary meaning. The pointed out in its post-trial instruction to consider the ing, and the general assumptions in a standard dictionary wedge with which the jury report the provision of the ally agreed that the provisory to a jury, although not rounds for a new trial. See *General Motors Corp.*, 470 Ad. 1984 ("It appears to be a consensus that a new trial simply because a dictionary jury.") (citing cases); U.S. no specifics as to words definitions may have added the verdict of obviousness.

The district court summarized the evidence that the prior art would have suggested the combination claimed in the '420 patent. The court referred to Ethicon's position that U.S. Surgical had adapted its own multiple clip applier to endoscopic use, and the testimony that the only significant difference from the prior art multiple clip applier was the elongation of the shaft and the seal, and that these were common to all endoscopic instruments.

Ethicon had objected to the substance of U.S. Surgical's proposed instructions, as well as asserting that they were unnecessary. We need not resolve this issue, for U.S. Surgical

has not shown that there are unclear or ambiguous technical terms or words of art or related aspects of claim scope whose "construction" as requested by U.S. Surgical would negate the verdicts of obviousness. The jury was instructed, without objection, that the language of the claims was to have its plain meaning. There was no dispute as to the meaning of technical terms or words of art as used in either the prior art or the claims. The difference between the prior art and the claimed invention is a question of fact, *Graham*, 383 U.S. at 17, 148 USPQ at 467, and was not overruled by the Court's *Markman* decision.

U.S. Surgical argues that if the district court had construed the claims for the jury, the jury could not have reasonably accepted Ethicon's argument that U.S. Surgical had simply made known endoscopic adjustments in its prior art multiple clip applier. This went to the ultimate question of obviousness, which was decided by the jury upon finding and weighing and evaluating the factual evidence of the *Graham* factors. U.S. Surgical does not explain how any reasonable claim construction that it requested would have deprived the verdict of obviousness of its support. Further, *Markman* does not authorize the trial judge to remove from the jury the factual findings required by *Graham*.

On careful consideration of the substance of the instructions on claim construction that the district court declined to give, and the instructions on the issue of obviousness, all in light of the particular issues in this case concerning the prior art, the claimed invention, and the Court's discussion in *Markman*, we conclude that the omission of the requested instructions did not prejudice the determination of obviousness. The criteria for grant of a new trial have not been met. See *Santa Maria*, 81 F.3d at 273; *Shatterproof Glass*, 758 F.2d at 626, 225 USPQ at 643 (new trial appropriate when there was prejudicial error; or when verdict against weight of the evidence).

Conclusion

On review of the proceedings at trial, we conclude that there was substantial evidence from which a reasonable jury could have held that the claimed subject matter would have been obvious to a person of ordinary skill in this field at the time the invention was made. The judgment of invalidity is affirmed.

The case was vigorously litigated, with extensive testimony, physical exhibits, and argument. We have been directed to no unfairness or incompleteness or prejudice in the

jury instructions with respect to obviousness. A new trial was properly denied.

Costs

Costs to Ethicon.

**AFFIRMED; MOTION FOR
NEW TRIAL DENIED.**

U.S. Court of Appeals
Federal Circuit

Micro Chemical Inc. v. Great Plains
Chemical Co.

Nos. 95-1504, -1514

Decided January 3, 1997

PATENTS

1. Patentability/Validity — Anticipation — Prior sale — Degree of development (\$115.0707.05)

Federal district court erred in holding patent directed to method and apparatus for adding small amounts of ingredients to livestock or poultry feed invalid under on-sale bar of 35 USC 102 based on inventor's offer, before critical date, to sell weighing machine to feedlot manager, since at time of alleged offer, inventor had not reduced invention of patent to practice, had not substantially completed invention, and had not demonstrated high likelihood that invention would work for its intended purpose, and since inventor's "offer" therefore could not trigger on-sale bar.

2. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (\$115.0903.03)

Patentability/Validity — Obviousness — Combining references (\$115.0905)

Patent directed to method and apparatus for adding small amounts of ingredients to livestock or poultry feed would not have been obvious in view of prior art weighing machine and prior art volume machines in combination, since there is no evidence of motivation or suggestion to combine prior art machines, since motion of mixing elements in volume machine would have been expected to cause inaccurate weighing, and prior art therefore led away from idea of combining features of weighing and volume machines, and since inventor's extensive efforts to solve problem of isolating weighing system tend to show that one skilled in art would

Boerix Mut. Life Ins. Co., 300 F.2d 610, 620 (1980). That instruction, it is noteworthy, has been found no Federal Trade Act cases involving enforcement of rights. That may be due to patentee's need to enforce his right to override unfair competition. Bad faith patentees have a "right to sue" from making, using, and selling to enforce those whose patent is held invalid [or *Concrete Unlimited, Inc. v. Concrete*, 776 F.2d 1537, 1539, 227 F.2d 85 (Fed. Cir. 1985), *cert. denied*, 819 (1986)]. "[A]ny patent right to . . . enforce its patent, includes threatening alleged infringement. See 35 U.S.C. §281." *Id.* That right is not unbounded.

OnSite Systems, Inc. (OnSite) brought Mirafi's law suit was an attempt to interfere with the business relationships of a competitor. Although nearly all patent infringement suits are an attempt to interfere with business relationships of a competitor, they are not a good faith expectation of

"infringement actions initiated in bad faith contribute to the furtherance of the policies of antitrust law or the antitrust law." *Ultraseal Ltd.*, 781 F.2d 1003, 1004 (Fed. Cir. 1985). Bad faith litigation, where a party sues on a patent he did or is not infringing, *id.* at 1004, is conduct which offends public policy.

Conduct under the North Carolina Competition Statute has been found at which offends established public policy and is immoral, unethical, oppressive, or substantially injurious to consumers. *Johnson*, 300 N.C. at 261 (citing *Spiegel, Inc. v. Wade Comm'n*, 540 F.2d 287, 297 (1976)). Thus, bad faith litigation, because it offends public policy, is either immoral, unethical, scrupulous, or substantially injurious to consumers, could violate North Carolina Fair Competition Statute.

Proof of patentee's bad faith must be made by clear and convincing evidence. *Loctite*, 781 F.2d at 876, 228 USPQ at 100 (citing *Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d 986, 996, 202 USPQ 342, 351 (9th Cir. 1979), *cert. denied*, 444 U.S. 1025 (1980)). Moreover, where there is a belief in infringement as well as validity by the patentee, there is a presumption of good faith. *Loctite*, 781 F.2d at 877, 228 USPQ at 101. Furthermore, a patentee is normally entitled to rely on a presumption of validity. 35 U.S.C. §282 (1988).

The district court found "a continuing course of conduct pursuant to which Mirafi not only initiated this litigation in bad faith, but engaged in a series of extra-judicial acts, both before and after the actual filing of the litigation, with the purpose, intent and effect of unfairly damaging Murphy and OnSite and secondarily Swanger, in the marketplace." (Conclusion of Law #25, A43). Having thoroughly reviewed the record, this court concludes that the district court's finding of bad faith litigation, which must be supported by clear and convincing evidence is clearly erroneous.

Here, without a determination of whether Mirafi knew the '765 patent was invalid or knew that appellees did not infringe the '765 patent, there can be no bad faith litigation. Moreover, all of Mirafi's extra-judicial activities, including notifying customers and potential customers of the litigation, are within the purview of actions a party with rights to enforce a patent may engage in to enforce the patent. See *Concrete Unlimited*, 776 F.2d at 1539 ("[T]aking business away from the Defendant by threats and infringement actions" is not necessarily unfair competition. Good faith patentees have "the right to exclude others from making, using, and selling the invention and to enforce those rights until the . . . patent [is] held invalid [or expires].") Evidence of prior intent not to litigate the patent, failure to litigate infringement claims against other parties, and communication with a sales force of intent to litigate and actual initiation of suit are all permitted activities. None offend public policy.

We likewise find Swanger's assertion that trial evidence clearly indicates that Mirafi had no expectation of winning and that the lawsuit was filed primarily for the purpose of destroying a competitor's reputation in the market to be unpersuasive. Having carefully reviewed the record, this court finds no evidence that Mirafi did not expect to win the suit against Swanger.

We therefore remand this issue to the district court for a determination of whether

there is clear and convincing evidence that Mirafi initiated litigation knowing the '765 patent was invalid or knowing that appellees did not infringe the '765 patent.

In view of our decision, the infringement issue is moot and that of damages is premature.

AFFIRMED-IN-PART, REVERSED AND REMANDED-IN-PART.

COSTS

No costs.

Court of Appeals, Federal Circuit

In re Young

No. 90-1368

Decided March 5, 1991

PATENTS

1. Patentability/Validity — Obviousness — Relevant prior art — In general (§115.0903.01)

Apparently conflicting prior art references must, in making obviousness determination, each be weighed for their power to suggest solutions to artisan of ordinary skill, and all disclosures in prior art must be considered to extent that they are in analogous fields of endeavor and thus would have been considered by person of ordinary skill in field of invention; in weighing suggestive power of each reference, degree to which one reference might accurately discredit another must be considered.

2. Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Applicant's claims for method of generating seismic pulse in water by use of at least three air guns disposed at critical distance from each other are obvious in view of prior patent which expressly teaches exact spacing set forth as limitation in each of applicant's claims, even though additional reference purporting to test different methods of pulse generation suggests avoidance of spacing taught in prior patent, since reference did not accurately test prior patent according to its teachings, particularly those regarding spacing, and therefore artisan of ordinary skill would have afforded reference little weight.

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of D. Raymond Young and John C. Wride (method and apparatus for generating an acoustic pulse in a body of water). From decision of Board of Patent Appeals and Interferences upholding final rejection of all claims, applicants' appeal. Affirmed.

Richard F. Phillips, Jr., Houston, Texas, for appellants.

Lee E. Barrett, associate solicitor (Fred E. McKelvey, solicitor, with him on brief), Arlington, Va., for appellee Patent and Trademark Office.

Before Newman, Lourie, and Rader, circuit judges.

Rader, J.

Raymond Young and his co-inventor John Wride (collectively Young) appeal from the October 31, 1989 and April 18, 1990 decisions of the Board of Patent Appeals and Interferences (Board). These decisions affirmed the final rejection of all claims in their application. The Board held Young's claimed invention obvious under 35 U.S.C. §103. This court affirms.

BACKGROUND

Young's application discloses a method and apparatus for generating an acoustic pulse in water. Acoustic pulse technology facilitates offshore seismic exploration. The acoustic pulse generates a large gas bubble in the ocean above geological formations on the ocean floor. The rapid expansion, and collapse of the gas bubble create a shock wave in the water. The shock wave propagates through the water into the formations below the ocean bed. As the shock wave passes downward through these formations, each interface between adjoining earth strata reflects a portion of the shock wave. These reflections move upward through the ocean. Hydrophones at the ocean's surface can monitor these reflections. From these monitored reflections, geologists can generate a "seismic section" map which shows the configuration of strata in the ocean bed.

Today's most common sources of seismic shock waves are air guns. These air guns feature a chamber for storing and releasing on command highly compressed air. A high-pressure hose charges the gun with

compressed air for rapid firing during a seismic survey.

Acoustic pulse technology suffers from problems with bubble oscillation. Upon release of the compressed air, the bubble undergoes a rapid initial expansion and collapse. Several more expansions and collapses follow the initial collapse, but with diminishing amplitude. Each of these expansion-collapse events creates an additional shock wave. The geological strata reflect each of these additional shock waves. The multiple reflections, in turn, blur the resolution of the seismic section. Most blurring comes from the first oscillation after the initial bubble collapse.

Acoustic pulse technology uses a "primary-to-bubble ratio" to measure susceptibility to oscillation. This ratio compares the shock wave intensity of the initial expansion-collapse to the intensity of the first oscillation. A high ratio means the secondary shock waves are less likely to blur the seismic section.

Young tries to raise the primary-to-bubble ratio above prior art air gun sources by reducing the amplitude of the first oscillation. Young seeks this result by spacing at least three air guns in a characteristic array. The array separates the guns from each other by a critical distance. The distance, D , is at least 1.2 times greater than R , but less than or equal to twice R . R is the maximum radius of the initial air bubble from each gun.* With this spacing, the bubbles from each gun intersect before any single bubble reaches its maximum radius. This intersection dampens the overall oscillation. Young's independent claims each include a spacing limitation within this range.

Independent claim 1 is illustrative:

A method of producing a seismic pulse in a body of water, including the steps of:

(a) disposing in the water a set of at least three air guns, each adapted to produce in the water a gas bubble having maximum radius substantially equal to the quantity R , where the guns are disposed at depths such that each produces, when fired, a bubble of maximum radius R , and the guns are disposed such that each gun is separated from each of the nearest guns thereto in the set by a critical distance, D , where D is substantially equal to $\sqrt{2}R$; and

(b) firing the air guns substantially simultaneously to produce a seismic pulse in the water.

* Mathematically, D is defined by $1.2 R \leq D \leq 2.0 R$.

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air for rapid firing during a survey. Bubble pulse technology suffers from bubble oscillation. Upon release of compressed air, the bubble undergoes rapid initial expansion and several more expansions and collapses. Each of these expansion-collapse cycles creates an additional shock wave. The multiple shock waves, in turn, blur the resolution of the seismic section. Most blurring comes from bubble oscillation after the initial bubble

collapse. Bubble pulse technology uses a "primary to secondary ratio" to measure susceptibility to bubble oscillation. This ratio compares the shock wave intensity of the first oscillation to the intensity of the second. A ratio less than 1 means the secondary shock wave is less likely to blur the seismic

section. To raise the primary-to-bubble ratio, prior art air gun sources by increasing the amplitude of the first oscillation. This is done by spacing the air guns in a characteristic array. The distance between guns separates the guns from each other by a critical distance. The distance, D , is 1.2 times greater than R , but less than twice R . R is the maximum radius of the initial air bubble from each gun. With this spacing, the bubbles from adjacent guns intersect before any single bubble reaches its maximum radius. This intersection minimizes the overall oscillation. Young's claims each include a spacing within this range.

Claim 1 is illustrative: "a method of producing a seismic pulse in a body of water, including the steps of: (a) disposing in the water a set of at least two air guns, each adapted to produce a bubble of maximum radius substantially equal to the critical distance R , where the guns are disposed at depths such that each produces, at a distance D , a bubble of maximum radius substantially equal to R ; (b) disposing the guns such that the bubbles from the guns are separated from each other by a critical distance D , where D is substantially equal to $1.2R$ to $2R$." The method of producing the air guns substantially simultaneously to produce a seismic pulse in

mathematically, D is defined by $1.2R \leq D$

Young's dependent claims define the number of the guns or their placement relative to each other or to the ocean surface.

The examiner rejected each of the claims as obvious under 35 U.S.C. §103 in light of five prior art references. The examiner relied primarily on U.S. Patent No. 2,619,186 to Carlisle (the "Carlisle patent" or "Carlisle") to reject Young's claims. Carlisle is the only reference cited by the examiner or Board which suggests the air gun spacing in Young's claims.

Young contested the Board's and the examiner's consideration of Carlisle. Young argued that Carlisle concerns reducing bubble oscillation for chemical explosives, not air guns. Young also argued that an article by Knudsen published six years after Carlisle in the journal *Geophysics* expressly discredits the teachings of Carlisle. W. Knudsen, *Elimination of Secondary Pressure Pulses in Offshore Exploration (A Model Study)*, 23 *Geophysics* No. 3 at 440 (July 1958) (Knudsen). Therefore, Young contended, a person of ordinary skill in the seismic exploration art would not have considered Carlisle when developing an improved seismic array.

The Board rejected Young's arguments. The Board held that the examiner appropriately applied Carlisle notwithstanding the teachings of Knudsen. On appeal, Young asserts as error only the propriety of applying Carlisle as a reference in light of Knudsen's allegedly contrary teachings.

DISCUSSION

This court must decide whether the Board properly affirmed the examiner's rejection over Carlisle. Young has not challenged the other references cited in the examiner's rejection. Further, Young has not argued the merits of any particular claim apart from the others. Therefore, all claims stand or fall together with representative independent claim 1. See *In re Kaslow*, 707 F.2d 1366, 1376, 217 USPQ 1089, 1096 (Fed. Cir. 1983).

The Carlisle patent — "Seismic Exploration Method" — issued on November 25, 1952. Carlisle concerns minimizing bubble oscillation for chemical explosives used in marine seismic exploration. Carlisle controls bubble oscillation by spacing seismic sources to achieve a reduction of the secondary pressure pulse. Carlisle specifically teaches spacing the seismic sources close enough to allow the bubbles to intersect before reaching their maximum radius. Carlisle spaces the bubble centers closer than two maximum bubble radii, or less than "2.0 R" in Young's nota-

tion. Carlisle, col. 3, lines 57-60. Carlisle explains:

[T]he secondary energy normally available from these sources is dissipated by their mutual intersection and tends to eliminate the secondary seismic impulses created when the walls of the bubbles collapse.

Id. at lines 60-64. Thus, Carlisle expressly teaches the spacing limitation in each of Young's claims.

Notwithstanding Carlisle's teachings, Young argues that the Knudsen article discredits Carlisle. Knudsen describes a series of tests which evaluated four proposed techniques for suppressing bubble oscillation. Carlisle was one of the four. Knudsen's article opined that Carlisle yields no appreciable improvement in bubble oscillation suppression. The effective teaching of the Knudsen/Carlisle combination, Young argues, suggests avoidance of the spacing suggested in Carlisle. Therefore, Young would have this court conclude that his use of Carlisle's spacing would not have been obvious.

Young misunderstands the effect that Knudsen has on Carlisle. The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Even if tending to discredit Carlisle, Knudsen cannot remove Carlisle from the prior art. Patents are part of the literature of the art and are relevant for all they contain. *In re Lemelson*, 397 F.2d 1006, 1009, 158 USPQ 275, 277 (CCPA 1968). For example, in *In re Etter*, 756 F.2d 852, 859, 225 USPQ 1, 6 (Fed. Cir.), cert. denied, 474 U.S. 828 (1985), a reference which disclosed obsolete technology remained in the prior art. This court considered the reference for what it disclosed in relation to the claimed invention.

[1] When prior art contains apparently conflicting references, the Board must weigh each reference for its power to suggest solutions to an artisan of ordinary skill. The Board must consider all disclosures of the prior art. *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976), to the extent that the references are, as here, in analogous fields of endeavor and thus would have been considered by a person of ordinary skill in the field of the invention. The Board, in weighing the suggestive power of each reference, must consider the degree to which one reference might accurately discredit another.

[2] As prior art, the Board correctly weighed Carlisle to determine the patentability of Young's claims. Carlisle expressly teaches both the method and the advantages

of Young's claimed spacing. In fact, Carlisle expressly teaches the exact spacing set out as a limitation in Young's claims. Thus, the Board correctly attributed significant weight to Carlisle in its obviousness determination.

In determining what weight to accord to Carlisle as prior art, the Board also appropriately considered Knudsen's discrediting effect. The Board determined that Knudsen did not convincingly discredit Carlisle. Therefore, the Board appropriately concluded that Knudsen would not have led one skilled in the art to reject Carlisle.

Knudsen did not test Carlisle according to its teachings. For instance, Knudsen did not use an explosive charge in modeling Carlisle. Rather, Knudsen tried to simulate Carlisle with a capacitive electrical discharge in a barrel of oil.

Knudsen did not replicate Carlisle's teachings on spacing. Knudsen tried to model Carlisle by separating the seismic sources by one, two and three bubble radii. Knudsen at 42. At the maximum spacing of three bubble radii, the bubbles will not intersect at all. Carlisle specifically requires spacing to permit bubble intersection. Carlisle, col. 4, lines 47-52. At a spacing of one bubble radius, the two bubbles coalesced into one before the initial collapse. Knudsen at 45. If just one bubble is present, the bubble will oscillate as if no second seismic source was present. Carlisle specifically requires spacing to prevent the formation of one bubble. Carlisle, col. 4, lines 34-37. Finally, at the two bubble radii spacing in Knudsen, the bubbles will just barely intersect. Carlisle requires that the bubbles intersect before each bubble achieves its maximum radius. Carlisle, col. 3, lines 58-60. In sum, Knudsen did not duplicate or appropriately model Carlisle's spacing.

Knudsen's conclusion that Carlisle would "not be effective in eliminating the secondary pressure pulse" also directly contradicts data contained in Knudsen. The Knudsen data point for the two-radii horizontal bubble spacing, although not a completely accurate model of Carlisle, shows a 30% reduction of the secondary pressure pulse. Knudsen at 45, Table 4. This data point represents the only point where Knudsen approximates the spacing shown in Carlisle. At that point, Knudsen confirmed Carlisle's teachings.

The Board found that Knudsen "did not test the Carlisle technique under conditions which are directly comparable to the Carlisle disclosure." Weighing the discrepancies between the Knudsen model and Carlisle's teachings, as well as Knudsen's tendency to confirm Carlisle where the model approxi-

mated Carlisle, the Board concluded: "we do not agree that Knudsen discredits Carlisle."

Because Knudsen did not accurately test Carlisle, an artisan of ordinary skill would not have dismissed Carlisle in light of Knudsen as a whole. It is far more likely that the skilled artisan would have afforded little weight to Knudsen itself. The Board did not err in relying on Carlisle and discounting Knudsen.

CONCLUSION

Knudsen is not so credible or persuasive of a contrary teaching that it would have deterred the skilled artisan from using the teachings of Carlisle. The examiner's use of Carlisle in his rejection of Young's claims is not clearly erroneous. The Board's decision affirming the examiner's rejection is therefore

AFFIRMED.

Maine Supreme Judicial Court

Nobel v. Bangor Hydro-Electric Co.

No. Cum-90-271

Decided December 17, 1990

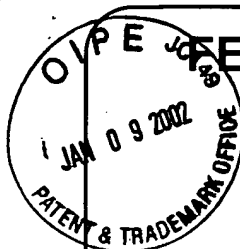
COPYRIGHTS

1. Elements of copyright — Federal pre-emption — Statutory pre-emption (205.0803)

Plaintiff's claim for unjust enrichment and conversion under Maine law, arising from defendants' alleged unauthorized use of phrase "energy light," is pre-empted by Copyright Act, 17 USC 301(a), since unjust enrichment claim imposes liability by operation of state law, rather than by additional element of promise to pay, and thus gives right equivalent to rights under Copyright Act, and since conversion claim which does not allege any deprivation of tangible property is equivalent to unauthorized publication claim and is therefore pre-empted.

Appeal from the Maine Superior Court, Cumberland County, Alexander, J.

Action by Michael Nobel against Bangor Hydro-Electric Co., Maine Media Inc., and Brenda Garrand, for breach of contract, unjust enrichment, and conversion. From dismissal of all claims, plaintiff appeals. Vacated in part, affirmed in part, and remanded.



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TOTAL AMOUNT OF PAYMENT (\$) 84

Complete if Known

Application Number 09/654,093
Filing Date August 31,, 2000
First Named Inventor Thakur et al.
Examiner Name P. Brock II
Group / Art Unit 2815
Attorney Docket No. 94-0302.02

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit
Account
Number

13-03092 (Order No. 94-0302.02)

Deposit
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Micron Technology, Inc.

- ☒ Charge Any Additional Fee Required
Under 37 CFR 1.16 and 1.17
☐ Applicant claims small entity status.
See 37 CFR 1.27

2. ☐ Payment Enclosed:

☐ Check ☐ Credit card ☐ Money
Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Fee Code	Entity Fee (\$)	Small Fee Code	Entity Fee (\$)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	
SUBTOTAL (1)					(\$) 0

2. EXTRA CLAIM FEES

Total Claims	13	-20 **	=	0	X	18	=	0
Independent Claims	4	-3 **	=	1	X	84	=	84
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Large Fee Code	Entity Fee (\$)	Small Fee Code	Entity Fee (\$)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 84

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Fee (\$)	Small Entity Fee Code	Fee (\$)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,280	241	640	Petition to revive - unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17 (q)	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 0

SUBMITTED BY

Complete (if applicable)

Name (Print/Type) Charles Brantley Registration No. Attorney/Agent) 38,086 Telephone 208-368-4557
Signature *Charles Brantley* Date December 4, 2001

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